

EXTENSION AT BRADFORD ROYAL INFIRMARY BRADFORD, UK

RETAINING STRUCTURES

Product: MacWall™ VSF

Problem

The Bradford Royal Infirmary was being extended by a £10 million fast-track, modular ward installation project.

The project involved deep excavations within a severely constrained site. Being a fast-track project, the construction team was keen on solutions that would maintain the rapid construction programme.

The retaining wall forms a structural perimeter to the new building, allowing construction of the wards to be at the same level as existing buildings on the site.

The retaining wall system had to be able to retain different site conditions encountered on the project. In some areas, the presence of local rock formations meant that the solution had to almost be a 'fascia', whereas in others, it had to act as a true retaining structure. To the rear of the site, existing service ducts and a tunnel had to be maintained.

The hospital would be constructed with prefabricated modules which would be craned into position over the pre-installed retaining wall solution. High crane loads would have to be accommodated in these locations.

Solution

Maccaferri's MacWall was selected as being able to meet the objectives most successfully. MacWall VSF is an engineered, reinforced segmental block, retaining wall system, comprising dry-laid concrete blocks in combination with Paragrid soil reinforcement geogrids.

Each course is located and connected using purpose-made nylon/fibreglass pins that ensure accurate alignment and setback every time a block is placed. This makes installation simpler and quicker than for traditional wall systems.

Client:

BRADFORD TEACHING HOSPITALS NHS TRUST

Main contractor name:

HACS CONSTRUCTION

Designer:

ROBINSON DESIGN GROUP / MACCAFERRI LTD

Product used:

MACWALL VSF, PARAGRID

Construction date:

WINTER 2008/9



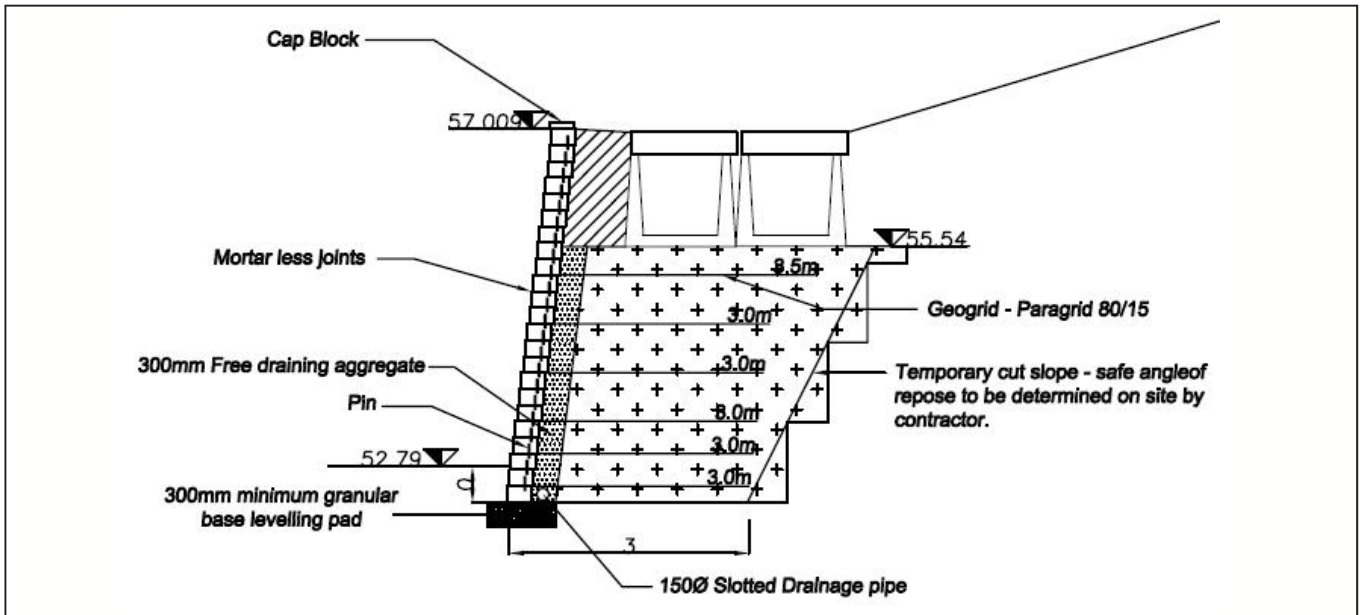
Excavation ready for MacWall against 'rock-face' at right



Early construction at foundation level; note drainage pipe



View of site, showing excavation to be retained



Typical cross section showing services tunnels above MacWall structure

The pins can be inserted into the blocks in different locations to adjust the setback of the block-courses. This alters the face angle; at Bradford, the face angle was a near-vertical 1.8°, minimising land-take. Geogrids are laid out behind the wall face at 400-600mm vertical increments. These are sandwiched between the block courses and layers of compacted backfill to create a reinforced earth structure of immense strength and durability. No mortar or other wet trades are used.

Traditional reinforced soil MacWall VSF walls were built where sufficient space allowed. In locations where there was not enough space for the width of reinforced soil structure to be installed, a concrete backfill was utilised. This enables the structure to behave as a mass gravity retaining structure. The blocks are secured to the concrete backfill using ties where appropriate.

The wall constructed was 120m long and up to 4.5m high. MacWall is available in a variety of colours to suit local aesthetic requirements. This job used a warm 'barley' tone.

The retaining structures created space for the three storey hospital extension and provided an additional 56 beds.



Nearing full height of wall



Post construction

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